

CA1
SW
-82M32
GOVT

Government
Publications

3 1761 11710025 5



**MICROTECHNOLOGY AND EMPLOYMENT:
ISSUES OF CONCERN TO WOMEN**

**Canadian Advisory Council
on the Status of Women**

Box 1541 Station B, Ottawa K1P 5R5

**Conseil consultatif canadien
de la situation de la femme**

C.P. 1541 Succ. B, Ottawa K1P 5R5

CA1
SW
-82M32

**MICROTECHNOLOGY AND EMPLOYMENT:
ISSUES OF CONCERN TO WOMEN**



**Canadian Advisory Council
on the Status of Women**

Box 1541 Station B, Ottawa K1P 5R5

**Conseil consultatif canadien
de la situation de la femme**

C.P. 1541 Succ. B, Ottawa K1P 5R5

MICROTECHNOLOGY AND EMPLOYMENT:

ISSUES OF CONCERN TO WOMEN

A Brief to the
Task Force on
Micro-Electronics and Employment

by the
Canadian Advisory Council
on the Status of Women

July 1982



ACKNOWLEDGEMENTS

This document was prepared and written by Susan Shaw under the supervision of Jennifer Stoddart. Word processing was carried out by Michelle Martel.

The text of this brief or parts thereof may be reproduced on condition that the CACSW is credited.

TABLE OF CONTENTS

PAGE NO.

1. INTRODUCTION	1
2. MICROTECHNOLOGY AND UNEMPLOYMENT	3
(a) Unemployment in the Service Sector	3
(b) The Hidden Unemployment Effect	4
(c) The Employment Outlook for Women in the Service Sector	5
3. NEW EMPLOYMENT POSSIBILITIES FOR WOMEN	8
(a) The Potential for New Job Openings	8
(b) Training and Re-Training Programmes	9
(c) Traditional Attitudes Towards Work	11
(d) The Option of Reduced Work Time	12
4. TECHNOLOGY AND THE QUALITY OF THE WORK ENVIRONMENT	14
(a) The Automation of Service Sector Jobs	14
(b) Health Effects of Automation	16
(c) Changing Work Structures	17
5. SUMMARY AND CONCLUSIONS	19



Digitized by the Internet Archive
in 2023 with funding from
University of Toronto

<https://archive.org/details/31761117100255>

1. INTRODUCTION

When the first computers were developed in the 1940s, there were predictions that many areas of our lives would be extensively changed because of the new technology. But the early computers were big, bulky, expensive and not always reliable. As a result, although they were used in large organizations and institutions, they appeared to have little direct effect on the lives of most Canadians.

Then came the development of the silicon chip, and the possibility of engraving thousands of internal computer circuits onto one small multi-layered chip of silicon known as the "integrated circuit" of the "microprocessor". This innovative microtechnology has greatly increased the capacity of computers while at the same time greatly decreasing their cost. A microprocessor today, for example, that costs \$50.00 has approximately the same capacity as a large computer built in 1960 for \$500,000.00.¹ It is the micro-chip, then, that has allowed for the present day increasingly widespread use of computers and computerized technology. The revolutionary potential of the computer is now being realized.

As with any revolutionary changes, the micro-chip has affected our lives extensively. Microtechnology has brought us electronic watches, electronic games, relatively cheap home computers and the possibility of the use of robotics in the factory and in the home. But perhaps the greatest impact of micro-chip processing has been in the area of information processing or "informatics". The microprocessor allows for the easy storage, retrieval, manipulation and dissemination of vast amounts of information. Consequently, anyone who works in the area of information processing is going to find that his or her work life is radically altered by the new technology if this has not already happened. This includes the great majority of workers employed in the service sector, that is, people working in offices, banks, supermarkets, telephone companies and the media, etc. Because most employed women are in this sector of the economy, women are particularly affected by the introduction of microtechnology into the workplace.

It is vitally important that the impact of microtechnology on our lives, and especially on our work lives, be recognized. The new technology has the

potential for improving people's lives by reducing the number of routine and repetitive tasks that have to be done. It also brings with it the potential for new prosperity because of increased productivity. However, a substantial number of women are not experiencing the benefits of microtechnology. In fact, they are suffering hardship because of increasing levels of unemployment in the service sector and because of a decreasing quality of the work environment.

Microtechnology, then, with its revolutionary impact on our society, can be seen as a "double-edged sword".² It offers us many benefits, but it may have negative social effects as well. The question to be addressed, though, is not whether to accept or reject the new technology. Automation, through the introduction of microtechnology, is inevitable. Companies and industries that do not automate will not remain competitive, and the federal government has provided support for the micro-electronic industry for this same reason. Instead, the question facing us is how to introduce the new technology - how to realize the rewards of reduced drudgery and increased productivity without causing hardship and suffering to any group or groups within society.

The beneficial effects of microtechnology should be shared by all, and we need to work towards reducing or eliminating any negative social effects. This requires an understanding of the problems that are already evident or that are predicted to arise out of introduction of microtechnology.

The first step then, is awareness of these problems and potential dangers, and the second step is to develop strategies - programmes, legislation and action - to avoid these problems. Our particular concern in this brief is with the impact of microtechnology of the work lives of women. Consequently, we will concentrate on the problems facing women which arise out of the increasing automation of labour market activity.

2. MICROTECHNOLOGY AND UNEMPLOYMENT

Much of our concern in the CACSW surrounding the introduction of microtechnology into the workplace centres on the loss of jobs for women. Accurate predictions regarding the extent of the overall employment effect, though, are difficult to make. Studies which have looked at this issue diverge in their conclusions and are not easy to compare because of the use of different forecast models. Many of the quantified forecasts have gloomy predictions of increasing unemployment, but have been criticized for having conceptual problems and failing to take into account other changes in the economy. Some researchers have suggested that any negative employment effects in specific sectors of the economy will be offset by positive employment effects in the economy as a whole,³ while others disagree.⁴

(a) Unemployment in the Service Sector

However, whether the overall employment effect of the new technology is positive or negative, it is clear that the demand for certain types of jobs will be greatly reduced if not eliminated. There is also agreement that the sector of the economy that will be most affected by reduced job opportunities will be the service sector.⁵ Predictions concerning the number of jobs in this sector which will be lost as a direct result of automation range from 20 to 40 per cent.⁶

The service sector, in fact, has been an obvious target for automation and the introduction of technology because of expansion and increasing costs. Clerical work and other types of service jobs have, until recently, remained heavily labour intensive, and the productivity level in these areas has not increased as it has in other sectors of the economy. Now, with innovations in computer technology relating to information processing, automation of many jobs within this sector has become a reality. The introduction of word processors into the office greatly reduces the time required for typing, correcting and retyping letters and documents, automated banking increases the productivity level of each teller, and computerized check-out points in supermarkets means that the same number of customers can be served with significantly fewer cashiers. Clearly this situation of increased productivity and

decreased labour power needs will lead to higher levels of structural unemployment, that is, to increased unemployment within the service sector itself.

As noted earlier, the effects of automation and decreased job opportunities in the service sector will be felt most by women, since women constitute over 80 per cent of workers in this sector. In fact, since two-thirds of all women employed in the labour market are currently in service sector occupations, the jobs of the majority of employed women can be considered to be "at risk" with the introduction of microtechnology. There is evidence from several case studies that the number of clerical workers employed in offices and banks is already being eroded,⁷ and this trend is likely to continue as more companies and businesses invest in micro-electronic equipment.

(b) The Hidden Unemployment Effect

The increasing unemployment in the service sector due to technology has not received much attention, to date, either by politicians or economists or by the media. This may, in part, be due to the fact that women's work is still considered by many to be of secondary importance - despite the fact that most women who work in the labour market do so out of economic necessity.

Another possible reason for the lack of concern over this issue is that the unemployment effect in the service sector is partially masked, i.e., it is greater than it appears to be at first glance. There have been no massive layoffs of clerical workers or other service workers, since reductions in staff in these areas are usually handled through attrition. Women tend to move in and out of the labour market much more frequently than men because of family and childcare responsibilities, or because of changes in their husbands' jobs, or because they find themselves in low-paying dead-end jobs. This high turnover in women's jobs allows employers to reduce the number of clerical or service workers they employ without having to resort to layoffs. Some companies, in fact, have deliberately avoided layoffs of clerical workers by postponing hiring permanent workers during the transition phase of the introduction of new technology.⁸ This reduction through attrition means that the loss

of jobs at any one time tends to be small, and that increasing levels of unemployment in this sector tends to go unnoticed.

Increasing clerical unemployment is also hidden by the lateral transfer of workers to other departments in the same company which have not yet been automated.⁹ Although this may mask the unemployment effect of microtechnology, it is clearly only a temporary solution to the problem and possible only as long as some non-automated departments remain.

Another method of coping with decreased labour-power needs has been the increasing use of part-time labour. This is especially evident in the finance industry where a number of banks have begun replacing full-time jobs with part-time positions.¹⁰ Again, this solution tends to obscure the fact of increasing unemployment and reduced job opportunities.

Finally, there is the "ripple effect".¹¹ This refers to the fact that companies - such as supermarkets - that invest in automation tend to increase their share of the market at the expense of unautomated companies. The unemployment effect in this instance shows up in the unautomated companies even though it is caused if indirectly, through the introduction of new micro-electronic technology.

(c) The Employment Outlook for Women in the Service Sector

The effect of microtechnology on levels of employment of women in the service sector should, therefore, be recognized as a serious problem. Even if the extent of the unemployment problem is partially hidden, its impact is very real. Examination of the available evidence suggests increasingly high levels of unemployment among this group of workers. The outlook for the future is even more gloomy, especially for clerical workers. A number of more recent innovations in micro-electronic technology could mean that there would be little or no use at all, in the future, for either secretaries or typists. One such innovation is the development of optical scanning units which allow the computer to read and store printed information, thus eliminating the need to type such information onto the terminal or word

processor. Another is the new plain language high level computer programmes that are simple to use, and that have been developed for executives and managers who wish to use the terminals and word processors themselves. With the possibility of voice simulation and voice recognition systems becoming widely available, it seems even more likely that managers will bypass the use of secretaries and instead interact directly with the computer systems themselves.

Clearly the employment situation has already caused hardship to women in the service sector who have suffered job displacement or job loss. Reduced job opportunities in this sector is also causing special hardship among women seeking to re-enter the labour market after taking time off to care for their families. Many of these women seek clerical work because their specific job training and experience has been in this area. In addition, young women seeking to enter the labour market for the first time are facing problems in finding jobs. All the evidence suggests that these problems are not going to disappear over the next few years. They are, instead, going to be exacerbated unless action is taken now to alleviate the hardship being faced and to re-direct women into other areas of the economy where job prospects might be expected to be better.

The degree of hardship faced by women because of automation and increasing service sector unemployment depends on a number of factors. First, it depends on the job security of those women currently employed. Second, it depends on the availability of training and re-training opportunities for employed and non-employed women that will allow them to move into other areas of the labour market. And third, it depends on the quality of the work environment for those women who retain their jobs in the service sector. If these workers remain in clerical and other types of service work, but the quality of their work environment is substantially reduced because of the introduction of microtechnology, they can also be considered to be facing increased hardship.

The outlook with regard to job security for service workers is not optimistic. Current legislation concerning layoffs is inadequate. Where it does exist it generally covers the extent of notice required for group layoffs only.¹² There is a need to develop legislation that would protect workers whose jobs are affected by the

new technology. For example, employers should be required to justify any layoffs and to implement procedures such as re-training, re-employment in other types of work, and relocation at their expense.

Female service workers are particularly vulnerable with regard to job security. Many of them are in part-time or temporary positions, and the chances are thus high that they would not be covered by layoff legislation in any case. In addition, even where workers have full-time permanent positions, the lack of unionization among these women means that they have reduced job security compared to other workers, and little protection against firings. Consequently, although layoff legislation would benefit some workers, there is a pressing need for other types of action as well to alleviate the problems being faced by service sector workers because of the introduction of microtechnology.

In the next section of this brief we turn to consideration of job possibilities for displaced service workers and for non-employed women in other sectors of the economy. We also examine other types of solutions to the unemployment problem such as different work structures. In section 4 we return to the problem of service sector workers, and the effect of microtechnology on the work environment for those who retain their jobs in the area of the economy.

3. NEW EMPLOYMENT POSSIBILITIES FOR WOMEN

(a) The Potential for New Job Openings

Although it is impossible to say whether there will be overall job loss or job gain as a result of the development of microtechnology, it is evident that some new jobs are being created in certain fields. There are some new jobs opening up in high technology, and the computer industry is expanding in many parts of the country. In fact, a shortage of highly skilled personnel is being predicted in certain technical and engineering areas.¹³

The number of potential new jobs in Canada in the micro-electronic field itself is limited by the high degree of foreign ownership of companies producing computer hardware products.¹⁴ According to the Science Council of Canada, though, there is more potential for expansion in the computer services industry (i.e., in computer "software") since this field is about 80 per cent Canadian owned.¹⁵ This could lead to increased job opportunities in the development of new and innovative high level computer software such as the plain language programmes mentioned previously.

Within the information processing field, any new jobs are likely to be in the professional or technical ranks.¹⁶ This might include jobs in the gathering, writing, analyzing and packaging of information - as opposed to jobs at a lower skill level concerned with just the storage, filing and retrieval of information. The new jobs, then, might possibly be in software programming, in research and in public relations, while clerical jobs, as we have already seen, are likely to decline.

If these new job opportunities in technical and professional areas do become a reality (and this is still a matter of speculation), the question will be, who will get these jobs? It may not necessarily be those workers who have lost their jobs because of the new technology, or workers with clerical training who are unable to find jobs. Indeed, the chances are high that few women will have the opportunity to benefit from these new job openings unless some positive action is taken towards this end.

There is evidence to suggest that very few displaced clerical workers move up into higher level administrative, executive or professional positions.¹⁷ Instead, there appears to be some lateral movement (i.e., to other departments in the same company at the same skill level), some workers who are forced to accept lower skilled jobs (often at lower salary levels as well) and some straight job loss.¹⁸ Also, there is little evidence of women moving into any new jobs being created in the technical sphere.

Women have traditionally been concentrated in certain occupations in the job market. Moreover, this occupational segregation of women has been, and remains, remarkably persistent. There are a certain number of jobs that are generally identified as "women's work", and only a very small percentage of women have made inroads into non-traditional or "masculine" work.¹⁹ This means that women have a narrower range (perceived or real) of job opportunities than men.

With the number of job opportunities in traditionally female work being drastically reduced, women are going to have to move into non-traditional areas of work. This is necessary to prevent them from becoming even more economically disadvantaged than they are at the present time.

But this is not going to be easy. Women face a number of problems in moving into different areas of work. First, they generally lack specific skills training for non-traditional jobs. In particular, they are much less likely than men to have a science or math background and they also lack technical and industrial skills. Second, they are often faced with traditional attitudes on the part of many employers who do not consider looking for women, or training women, for particular types of jobs. And third, most women themselves continue to look for work in traditional spheres.²⁰ They are socialized away from "masculine" fields and may suffer from "technophobia" or lack the confidence to enter technical or scientific areas of work.

(b) Training and Re-training Programmes

The problem of women lacking appropriate skills for the new job openings is clearly one that needs to be addressed through training and re-training program-

mes. Such programmes are necessary for the population as a whole since we are living in a society of rapid technological change. Because of this rapid change, we have to change our perspective on training and education as something for young people only, and think, instead, of education as a life-long process. We have to be able to adapt to changes in society and, in particular, to changes in the workplace.

For women, training and re-training programmes are particularly crucial as we move into a new technological era, because of their lack of basic technological skills. Also, the specific work skills which they do have tend to be those that are becoming redundant, or at least in less demand.

The new National Training Act, which has already passed its third reading in the House, goes part of the way towards recognizing the problem of skills training. Its notion of "Critical Trade Skills Training" should help industry to identify where the need for skilled personnel exists, and direct workers into areas where there are job opportunities. However, by failing to recognize and taking into account the special needs of women, the Act is likely to benefit male rather than female workers. Clerical and other service workers displaced by the new technology are not likely to take advantage of industrial skills training programmes (or be unable to take advantage of such programmes) unless these programmes offer basic introductory courses in industrial and technical areas, and unless they go hand-in-hand with affirmative action programmes. At present, clerical and service workers rank very low with regard to their opportunity for educational leave. They need both opportunity and encouragement - which could be provided through affirmative action - if they are to branch out into new, non-traditional areas of skill training.

Apart from specific industrial skills, which is the main concern of the new Training Act, there is also a need for training and re-training programmes in broad or generic skills. The rapid change that characterizes today's society means that any specific skills training may become redundant in a short period of time. For example, familiarity with particular computer software may be of short-lived usefulness as new and innovative software programmes are developed. In today's technological era, such generic educational courses might include some basic scientific training, training in computer literacy, exposure to different systems of logic and training in

communication skills, both written and verbal. Such a training programme should enhance job mobility, whereas very specific and narrow training programmes run the risk of creating new job ghettos in the future.

Furthermore, training and re-training programmes, if they are to reach women affected by the new technology, must be available to people who are presently outside the labour force or who are ineligible for certain training programmes because they only work part-time. Training allowances should be available for women seeking to re-enter the labour market, and programmes should take into account the needs of low income women and women who have family and childcare responsibilities.

(c) Traditional Attitudes Towards Work

Even if appropriate training programmes are available, and affirmative action plans are also incorporated, though there remains the problem of the attitude of women themselves, arising out of their socialization. Surveys show that the majority of young women, especially working class women, are still expecting and wanting jobs in traditional "women's work".²¹ There is a need for an extensive information and education campaign to inform women of present and future job market possibilities. There is also a need to convince both women workers and male employers that women are capable of working successfully in non-traditional areas of the economy.

Career counselling has an important role to play here both with regard to re-entry of women and to young women first entering the labour market. Women and girls need to be steered away from work (such as clerical work) where there will be few job opportunities and into other types of careers. They need to be encouraged to take math, science and computer programming in order to enhance their job mobility. In addition, they need to be helped to deal with any "technophobia" problems through discussion, education and experience with technology.

We need to recognize the present need for career counselling and help among older women, but in the long run it is crucial that these problems be addressed

at an early age. School teachers, both at elementary and high school levels, should be made aware of the labour market problems facing women and the issue of the sex segregation of jobs. Early socialization influences are important, and schools should make sure that they provide girls, as well as boys, with early experience in scientific, industrial and technological areas.

These suggestions can be seen as a means of building a support system for women to enable them to branch out into all areas of the economy. It is our belief that only if this kind of support system can be developed will women be able to take equal advantage of any training and re-training programmes that are offered.

(d) The Option of Reduced Work Time

We consider that training and re-training programmes are extremely important, but even so, we would like to stress that they are not necessarily a complete solution to the problem of structural unemployment. They can help to direct people into areas where job opportunities are thought to exist. Nevertheless, if there is a net job loss resulting from the impact of microtechnology, or even if the overall number of jobs remains stable, there is still the problem of unacceptably high levels of unemployment.

One approach to this problem, that is worthy of serious consideration, is the development of new and innovative options for reducing the work time of employed individuals. This approach is based on the principle that the available work should be shared among as many people as possible.

There is already evidence of increased part-time work resulting from the shortage of full-time positions - for example, among bank tellers. This solution as it exists today, though, is far from being an ideal one. Part-time work may be an attractive option in some ways for women who have family responsibilities, but it also generally means very low incomes, temporary work with little or no job security, and few, if any, normal work benefits such as pension benefits. Part-time workers are also rarely able to become members of unions or to take advantage of company training schemes or educational leave.

Clearly there is an urgent need to legislate improved conditions for part-time workers. If such working conditions were more attractive, part-time work and job-sharing might help to redistribute existing employment opportunities among members of the labour force who opt for such an arrangement. The evidence indicates that a fairly sizeable number of women would prefer to work part-time because of their responsibilities in the home. Hopefully, it would also be an attractive solution for some men as well who wish to do their share of the household jobs and childcare duties.

Another more equitable solution, aimed at sharing the available work, is to move towards a shortened work week. The advent of microtechnology brings with it the possibility and reality of greatly increased productivity. Instead of such increased productivity leading to unemployment for certain segments of the population, the solution of a reduced work week would mean that the benefits of microtechnology are shared among all workers. A 30 or 35 hour work week should not be rejected as unreasonable, and with higher productivity levels reduced working hours should be possible without having to reduce salaries. We hope that unions, management and government policy-makers will look seriously at the possibility of a reduced work week and at other ideas for changing the existing work structure. Reduced work time can also be accomplished through longer vacations and early retirement. Attitude surveys would be an important first step to determine workers' attitudes to these various means of sharing existing labour market work on a more equitable basis.

4. TECHNOLOGY AND THE QUALITY OF THE WORK ENVIRONMENT

(a) The Automation of Service Sector Jobs

Apart from the problems of job loss and unemployment, another area of concern for women is the effect of microtechnology on the quality of the work situation. Again, this is particularly significant in the service sector where the new technology has led to the automation of many jobs.

Microtechnology raises the possibility of an improved work environment. Automation can potentially do away with many tedious jobs, for example, clerical workers can be liberated from such things as correcting and re-typing manuscripts, and bank tellers can be freed from much of the paper work that used to be a part of their job. There is also the potential for clerical and other service positions to be enriched. Freedom from many of the routine chores can give workers the opportunity to be involved in more executive and administrative roles. This type of job enrichment could, in fact, easily provide low level workers with a pathway into possible executive or managerial ranks.

Unfortunately, there is little evidence of job enrichment resulting from automation in the service sector. Instead, the reverse appears to be the case. Many workers who stay in the service sector after automation has been introduced, find that their jobs are de-skilled and that the quality of their work environment decreases in a number of significant ways.²²

The computerization of work, with its emphasis on speed and efficiency, tends to lead to job fragmentation and specialization. The result is that many types of jobs - such as office jobs - which used to involve a variety of activities, now more closely resemble assembly-line work in factories.²³ This is particularly true for work that involves keyboarding, for example "power typist" positions in word processor centres. In this type of work many of the traditional skills associated with secretarial work are no longer required or utilized. Editing and layout skills are no longer significant, and even typing ability is less important with a word processor since corrections are quick and simple to make.

The work, therefore, following this kind of assembly-line approach to automation, becomes more repetitive, routinized and boring than before. Often machines are strictly programmed to perform only one task, and workers have little opportunity to use their initiative or their intelligence. In such situations, the only way open to workers to prove their skill level to their employers is by speed, that is by the number of keystrokes per minute. Other skills and abilities become less relevant or redundant.

This de-skilling of jobs not only leads in some cases to lower rates of pay, but also leads to stress arising out of boredom, reduced autonomy and reduced responsibility. The absence of mental activity, in fact, tends to make the jobs more demanding and stressful to the worker rather than easier.

Perhaps the major cause of stress, though, in the new automated service sector jobs, is the automatic monitoring of performance by machines. This, of course, usually means the monitoring of speed rather than any other aspects of performance. This system of monitoring is now common in many jobs, for example for typists, check-out clerks, telephone operators and bank tellers, etc. Constant automatic monitoring greatly adds to the pressure of work and the pressure for speed. It is a system that is inhumane, and we believe that workers should have the right to reject individualized monitoring in the workplace.

The de-skilling of clerical and service work also leads to a bipolarization of skills. That is, while an increasing number of jobs require only a very low level of skill after automation, new jobs are meanwhile being created which require highly skilled professional and technical people. This widening of the skills gap has been noted by a number of researchers.²⁴ It leads to reduced career mobility for people who enter the work force into jobs of low skill level. Any possibility that might have previously existed for advancement through experience is virtually lost. The trend towards increasing part-time work that is occurring in some areas also has the effect of decreasing career mobility.

Many of the negative effects on the quality of working life arise out of an assembly-line approach to automation. Although such an assembly-line or centralized

approach may be more efficient from a time-management viewpoint, it is detrimental to workers, and therefore, it could be argued, in the long run to management as well.

An alternative system is that of decentralization. Here "standalone" machines might be used rather than typing pools where all terminals are connected to a central computer memory. Workers can then use the new technology to free them from many of their routine and time-consuming tasks, and could possibly use the time gained to take on more executive and administrative roles. In this way, many clerical and service jobs can be value-added rather than down-graded.

There are some examples of this kind of system being implemented with positive results. One insurance company, for example, re-structured its work so that one employee would take on and follow through on a particular case rather than splitting up the work in an assembly-line manner.²⁵ It would be possible for many jobs to be re-organized in such a way thorough, for example, the formation of autonomous or semi-autonomous working groups.

To implement this kind of system would clearly require consultation between management, union and workers when any new technology is introduced. But, the present legislation concerning advanced notice of technological change is inadequate. Federal legislation only relates to those employees who are within the Canada Labour Code, and then only applies if a "significant number" of workers are expected to be affected. Provincial legislation varies throughout the country, and there are a number of provinces which do not have any advanced notice legislation at all.²⁶ New legislation is needed, therefore, which would not only require management to inform unions and workers about any plans for introducing new technology, but would also require consultation with regard to how such technology should be introduced.

(b) Health Effects of Automation

The adverse physical health effect of some of the new technology is also of great concern to women. Video display terminals are particularly problematic

with regard to health matters. They have been shown to cause headaches and eye problems - especially eye strain - because of poor lighting and glare and flickering from the screen.²⁷ They are also suspected of having some effect on the development of cataracts. In addition, BDTs, supermarket check-out counters and other new equipment have been associated with ergonomic problems which cause backaches and muscle strain.

Immediate action should be directed towards these problems. In many cases the problems can be solved through the re-design of equipment and through attention to lighting and other environmental conditions. In order to ensure that this action takes place, health and safety committees need to be set up in the workplace. Also, effective regulations for the use of VDTs and other machinery need to be developed through further research and through consultation with researchers and workers.

The radiation hazard of VDTs is a controversial issue. Some government and research reports claim that VDTs are safe and that radiation levels are minimal.²⁸ However, several reports of increased frequency of birth defects among babies born to VDT workers remain unexplained. Clearly there is a need for more research in this area as well. Such research, we suggest, should include measurements taken in the workplace with machines that are in use as well as laboratory tests with new equipment.

(c) Changing Work Structures

Turning to the issue of work structure, some predictions have been made about new forms of work in the service sector, especially with regard to clerical work. These include predictions not only of increased part-time work, but also of a move towards shift work and homework.²⁹

Shift work might appear to be a logical step as companies invest more and more capital in expensive technological equipment. Twenty-four-hour usage of such equipment would mean that companies get maximum return on their investment. The

prediction for homework is based on an expectation that home computers will become common. If this happens, clerical workers could do all or most of their work out of their own home once their terminal is linked up to the central computer memory of the company they work for. It would also mean reduced capital expenditure for employers.

The notion of homework has been heralded by some as having great advantages for handicapped people, people living in rural areas and women with young children. Although this may be partially true, there is also a danger of exploitation in a system of homework. Legislation needs to be developed to protect homeworkers from potential abuse. At present they are not covered by labour legislation and most homework is piece work for low rates of pay. It should also be recognized that homework can lead to the re-isolation of women in the home, and, in the case of women with young children, to the burdening of women with two jobs instead of one. It is important that homework should not be seen as an answer to the day care problem. For women to have to stay home, and to have twice as much work to do than before, is clearly not a good system either for the women or for their children.

It is also important that any changes in patterns of work should not be forced upon workers. A flexible system needs to be developed whereby workers could perhaps opt for homework or shift work if they choose to do so. Again, we believe that new systems of work should not be introduced without consultation and agreement with the workers involved.

In conclusion, it could be said that the introduction of microtechnology into the workplace has resulted, in most cases, in a decreased quality of working life. We do not believe, though, that this decline is necessarily an inevitable outcome of automation. If the new technology is implemented humanely, with worker participation, it may well be possible to improve the working conditions for many service sector workers. This would allow them to reap some of the benefits of the new technology rather than to suffer from its negative effects.

5. SUMMARY AND CONCLUSIONS

In this brief we have outlined what we believe to be the major problems faced by women resulting from the introduction of microtechnology into the workplace. We have concentrated on women in the service sector because it is these workers who are bearing, and will continue to bear, the brunt of the negative effects of the new technology. We have also made some suggestions with regard to possible new programmes and legislation which we hope will help to alleviate the hardship being suffered by these women.

We believe that it is important, first of all, to recognize the problems that are being created for some segments of the population because of the automation of jobs. The picture of the present technological revolution should not be depicted as totally positive as it sometimes is depicted by leaders in the field of high technology. Awareness and an understanding of any negative social effects is necessary. In this regard, we have suggested the importance of an information and education programme. Such a programme would be aimed largely at women and girls, but it would hopefully also have an impact on employers, managers and government officials as well.

We have outlined the problem of increasing unemployment in the service sector, and discussed predictions that the situation is likely to get worse rather than better as some of the latest technological developments become widely available. One solution that has been suggested is that of increased job security for workers such as through improved layoff legislation. Such legislation should require employers not only to justify layoffs, but to provide alternatives for workers who lose their jobs. Procedures should be developed for the implementation of re-training, re-employment and relocation programmes for all workers affected.

Nevertheless, since the erosion of jobs in the service sector does not usually come about through layoffs, other solutions need to be found as well. Programmes need to be developed to direct women into other areas of the economy and into industrial, technical and professional jobs, where positions may be more readily available.

The need for more extensive and appropriate training and re-training programmes has been recognized by the federal government in the new National Training Act. However, further action needs to be taken to enable women to take full advantage of such programmes. Introductory courses in basic industrial and technical skills should be available, and courses in broader generic areas, such as computer literacy, should be encouraged to enhance job mobility. In addition, any training and re-training programmes should be available for people who are currently not employed or are only employed on a part-time basis. Many women fall into these two categories and training allowances should be available to them as well as to people whose jobs are affected by the new technology.

We also feel that the simple provision of training programmes is not sufficient. We strongly recommend that affirmative action programmes be developed in conjunction with training programmes. Affirmative action is required, we believe, to ensure the equal participation of women and other disadvantaged groups. Given the socialization of women into traditional areas of work, career counselling is also important to encourage women and girls to move into non-traditional areas where more jobs are likely to be available. Women need information about appropriate job training and help with dealing with problems such as technophobia.

The unemployment problem can be alleviated, as well, through a reduction in work time. We have discussed the possibility of moving to a shorter work week. Other possibilities to be considered include increased vacation time and early retirement. We recommend that these suggestions receive serious study.

Increased part-time employment is already being implemented in some areas to reduce job loss. We are concerned about the exploitative nature of most part-time work, and reiterate the need to develop legislation that would adequately protect part-time employees. If such protection were available, part-time work and job sharing could well be extended and would be another method of helping to alleviate problems of job loss and reduced job opportunities. However, we believe that these forms of employment should be an option for men and women, and should not be their only alternative to unemployment.

In the same way, other possible new work structures in the service sector, such as shift work and homework, should be a matter of choice for workers and not something that is forced upon them. We feel that such forms of work, especially homework, have potential negative repercussions for women. We would, however, support a flexible system where a number of realistic alternatives were available to workers, and where they would have some freedom to choose the alternative that best suits their lifestyle.

We have also discussed, in this brief, the question of the quality of the work environment with regard to the automation of service sector jobs. We have noted the problems associated with a centralized system of computerization of work, which leads to an assembly-line approach to the allocation of jobs. The alternative decentralized system, with its increased potential for job enrichment and career mobility is, we feel, a much preferred system, and one that should be encouraged. It has benefits not only for workers, but for management as well - despite being less efficient in a strict time-management sense.

In order to encourage the implementation of systems of work automation that are not detrimental to workers, we recommend that new legislation be developed. Such legislation should require management to not only inform unions and workers of any plans to introduce new technology, but should also require consultation between these groups with regard to how the implementation of the new system is to be accomplished. Workers should be made aware of exactly how automation will affect their jobs so that they can provide informed input into the process of consultation.

The system of automatic monitoring that has already been introduced into a number of different types of work is particularly problematic for workers, causing stress and heightened levels of anxiety. We feel that workers should have the right to reject constant individualized monitoring of their performance.

With regard to the effect of microtechnology on health, we are concerned about the lack of adequate research in this area. More research needs to be

encouraged, and should include surveys of workers and studies carried out at the workplace and not just in the laboratory. Effective standards need to be developed, based on sound research findings, and committees should be established in the workplace to ensure that these standards are maintained. Such committees could also monitor and report on any new emerging health problems related to new technological developments as they arise.

Finally, we would like to stress the importance of developing a system that would monitor the impact of microtechnology on work on an on-going basis. This would include monitoring not only health-related issues, but also the employment situation and changes in the quality of work environment. Other, as yet unforeseen, issues which require attention may also arise.

We cannot tell at this point what the full impact of the technological revolution, which we are currently experiencing, will be. Clearly it has many positive benefits for our society. But, like any major social change, it is bound to bring its share of problems as well. The challenge before us is to enhance the benefits while at the same time preventing or alleviating any problems which may arise. It is also vital that the benefits reaped from the new technology should be shared among all members of society. We should work to reduce and eliminate any hardships suffered by women - who are already disadvantaged with regard to employment and income levels - during this period of transition.

FOOTNOTES

1. Science Council of Canada. Planning Now for an Information Society. Tomorrow is Too Late. Ottawa: Supply and Services Canada, 1982.
2. Microelectronics has been referred to as a "double-edged sword" by the International Labour Office, and the Club of Rome, in its discussion paper on the impact of microtechnology (Oct. 1979). Spoke of "the century decade of danger and opportunity". Cited in New Technologies: Their Impact on Employment and the Working Environment. Geneva: International Labour Office (ILO), 1982.
3. For example, Stephen Peitchinis, The Introduction of Computer-Aid Design (CAD)/Computer-Aided Manufacturing (CAM) Systems and Their Employment Implications. Ottawa: Industry, Trade and Commerce, 1980.
4. For example, the Federation of Commercial, Clerical and Technical Employees (FIET), in its document "Computers and Jobs", November 1978. Cited in New Technologies: Their Impact on Employment and the Working Environment, Geneva: ILO, 1982.
5. Zavis Zeman. The Impacts of Computer/Communications on Employment in Canada - an overview of current OECD Debates. Montreal: Institute for Research on Public Policy, 1979.
6. Heather Menzies. Women and the Chip: Case Studies of the Effects of Informatics on Employment in Canada. Montreal: Institute for Research in Public Policy, 1981.
Simon Nora and Alain Minc. L'informatisation de la société. Paris: La Documentation Française, 1978.
7. Working Women. Race Against Time: Automation of the Office. An Analysis of Trends in Office Automation and the Impact on the Office Workforce. Cleveland, Ohio: National Association of Office Workers, 1980.
Menzies, op. cit.
Stephen Peitchinis. Technological Changes and the Sectorial Distribution of Employment. Department of Industry, Trade and Commerce, Ottawa, 1980.
8. For example, see Survey of the Computer and Electronics Industries and Impact of New Technology on Three Companies in Nova Scotia. Departments of Labour and Manpower, Education and Development and the Canada Employment and Immigration Commission, Halifax, October 1981.
9. Heather Menzies, op. cit.
10. Heather Menzies. Computer Technology and the Education of Female Students. An Information Paper for the Canadian Teachers' Federation, 1982.
11. Heather Menzies, op. cit., 1981.

12. Susan Attenborough. Microtechnology. A National Union of Provincial Government Employees booklet, 1982.
13. Science Council of Canada, op. cit., and David A. Dodge. Labour Market Development in the 80s. Ottawa: Employment and Immigration Canada, 1981.
14. Science Council, op. cit.
15. Ibid.
16. Heather Menzies, op. cit., 1981.
17. Ibid.
18. Heather Menzies, op. cit., 1981.
Working Women, op. cit.
19. Statistics Canada. The Labour Force (December 1979), Department of Industry, Trade and Commerce, Ottawa, 1980.
Statistics Canada. Perspectives Canada III, Department of Industry, Trade and Commerce, Ottawa, 1980.
20. Heather Menzies, op. cit., 1982.
21. Ibid.
22. Heather Menzies, op. cit., 1981.
Working Women, op. cit.
23. Working Women, op. cit.
24. Heather Menzies, op. cit., 1981.
Science Council of Canada, op. cit.
Working Women, op. cit.
Evelyn N. Glenn and Roslyn L. Feldberg. "Degraded and Deskilled: the Proleterization of Clerical Work". Social Problems, 25 October, 1977.
25. See, "The Effects of Technological and Structural Changes on the Employment and Working Conditions of Non-Manual Workers". Advisory Committee on Salaried Employees and Professional Workers, International Labour Office, 1981.
26. Susan Attenborough, op. cit.
27. Bob DeMatteo. The Hazards of VDTs. Published by the Ontario Public Service Employees Union, October 1981.
"Video Display Terminals". Health Alert. The Health and Safety Newsletter of the Labour Council of Metropolitan Toronto, Sept.-Oct. 1980.
Patricia McDermott, "The New Demeaning of Work". Canadian Dimension, 15(8) and 16(1), December 1981, pp. 34-37.

- Melanie Conn. "Very Damning Testimony". Health Sharing, Spring 1982, pp. 11-13.
28. Eliot Marshall. "FDA sees no Reaiation Risk in VDT Screen". Science, 212, 5 June, 1981, pp. 1120-1121.
29. Patricia McDermott, op. cit.
Robert Arnold Russel. The Electronic Briefcase: the Office of the Future. Montreal: Institute for research on Public Policy, 1978.
"Automating the Office: Draining the Typing Pool". Canadian Dimension, 15(8) and 16(1), December 1981, pp. 31-34.
C.C. Gotlieb. Computers in the Home: What They Can Do for Us - And to Us. Montreal: Institute for Research on Public Policy, 1978.
"The Future of Home Work". Report to the Prime Minister of France, 1981. Summarized in New Technologies: Their Impact on Employment and the Working Environment. ILO, Geneva, 1982, pp. 117-119.

